

REMARK

Applicant respectfully requests reconsideration of this application as amended.

All existing claims have been cancelled, and new claims 46-67 have been added.

Therefore, claims 46-67 are present for examination. (Note: The previous claims were inadvertently numbered as claims 21-30 and 32-46, but were renumbered to be claims 21-45 by the Examiner. The new claims thus now begin at claim 46.)

35 U.S.C. §112 Rejection

The Examiner rejected canceled claims 21-45 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The previous claims have been cancelled and replaced with new claims. It is submitted that the new claims particularly point out and distinctly claim the subject matter that the Applicant regards as the invention under the requirements of 35 U.S.C. §112, second paragraph.

35 U.S.C. §102 Rejection

The Examiner rejected canceled claims 21-45 under 35 U.S.C. 102 (b), as being anticipated by U.S. Patent 5,508,500 of Campardo et al. ("Campardo").

The Applicant respectfully submits that the submitted claims, as presented herein, are not anticipated by Campardo, and that there are significant differences between the claims and the operations that are described by Campardo.

Claim 46 reads as follows:

46. A method comprising:
receiving a signal pulse; and

in response to the signal pulse:

- pulling a voltage of a first drain bias circuit for a non-volatile memory cell to a voltage potential of a voltage source;
- pulling a voltage of a second drain bias circuit of a reference cell to the voltage potential of the voltage source; and
- shorting a sense node for the non-volatile memory cell to a reference node for the reference cell.

Voltage of First Drain Bias Circuit and Second Drain Bias Circuit -- Among other elements, claim 46 thus requires that a voltage of a first drain bias circuit and a voltage of a second drain bias circuit be pulled to the voltage potential of a voltage source. Assuming for the sake of argument that the voltages of nodes 16 and 17 in Campardo are the voltages of a first drain bias circuit and a second drain bias circuit, connect nodes 16 and 17 are *not* pulled to the voltage potential of the voltage source, but are instead equalized together at a chosen intermediate voltage. After cautioning against setting an equalizing voltage that is either too low or too high, (Campardo, col. 7, line 56 to col. 8, line 20), Campardo provides that an adaptive equalizing network automatically sets the voltages of the nodes at “an intermediate point corresponding to a balance condition of the array and reference branches The above condition is balanced in the sense that it is exactly halfway between the written cell read condition ... and the erased cell read condition ... so that the circuit is in an excellent condition to be unbalanced one way or the other at the end of the ATD pulse” (Campardo, col. 8, lines 21-35) Therefore, Campardo does not provide that the voltage potentials of drain bias circuits are pulled to the voltage potential of a voltage source.

Sense Node and Reference Node -- Further, claim 46 provides for shorting a sense node for a non-volatile memory cell to a reference node for a reference cell in response to a signal pulse. This element is not contained in Campardo.

In Figure 1 of Campardo, array bit line 6 is connected to an array cell 4 in a memory array 5. Array bit line 8 is connected to reference memory cell 7. In Figure 1, array bit line 6 and array bit line 8 are shown running into a box labeled "Decoding, Biasing and Equalizing Circuit [sic]", element 10. Campardo provides that "Circuit 10 provides for selecting the array bit line 6 of the cell 4 to be read, appropriately biasing it (and reference bit line 8) to prevent spurious read phenomena such as soft writing, and *possibly also equalizing lines 6 and 8 before the cell is actually read.*" (Campardo, col. 2, lines 9-13) No other mention of this concept is present in Campardo. There is specifically no indication that equalization of these lines occurs in response to the signal pulse that also results in pulling voltages of drain bias circuits to the voltage potential of the voltage source. Further, as it is actually shown and described in Campardo, the circuit 10 does *not* provide for any equalization of lines 6 and 8. (Note: The Office Action identifies node 16 in Campardo as a sense node and node 17 as a reference node. Because such nodes are *not* connected to the memory cell 4 and the reference cell 7 respectively, but instead are each connected to the decoding, biasing, and equalizing circuit 10, it is respectfully submitted that the Office Action does not correctly identify the node locations in Campardo.)

Figure 5 of Campardo again shows circuit 10. "For a clearer understanding of the connection of generating circuit 20 to read circuit 1, FIG. 5 also shows current/voltage converter 9, decoding, biasing and equalizing circuit 10, and memory cell 4 of FIG. 1." The equalization of lines 6 and 8 is not discussed in connection with Figure 5.

Figure 7 of Campardo further discusses circuit 10 without any mention of equalization of lines 6 and 8. “More specifically, in FIG. 7, circuit 10 in FIG. 1 is shown divided into a known equalizing circuit 55 and a known decoding and biasing circuit 56 (not shown in detail).” As seen from Figure 7, the equalizing circuit has no effect on lines 6 and 8 and does not equalize the potential of such lines. The remaining portion of circuit 10 is “Decoding and Biasing Circuit” 56, which is not intended to equalize any voltage potentials.

Figure 8 of Campardo further breaks down circuit 10, showing an equalizing circuit 55, a biasing circuit 71, and a decoding circuit 72. Nothing shown in Figure 8 has the function of equalizing lines 6 and 8. Therefore, the circuit diagrams and corresponding descriptions of Campardo do not illustrate any equalization of lines 6 and 8. It is thus submitted that Campardo does not contain the element of claim 46 relating to shorting the sense node with the reference node in response to the signal pulse.

For at least the above reasons, Campardo does not anticipate claim 46.

Remaining Claims -- It is submitted that the arguments provided above are also applicable to independent claims 55, 61, and 67. The remaining claims are dependent claims and are allowable because they are being dependent on the allowable base claims.

The dependent claims contain many other independently allowable elements. Examples of these differences are the following:

Claim 50 -- Claim 50 provides that “shorting the sense node to the reference node comprises enabling a semiconductor device coupled between the sense node and the reference node” Again, Campardo provides no explanation or information regarding shorting sense nodes to reference nodes.

Claim 52 -- Claim 52 provides for “pulling the voltage potential of the sense node to the voltage potential of the voltage source minus the voltage across the first drain bias circuit” and “pulling the voltage potential of the reference node to the voltage potential of the voltage source minus the voltage across the second drain bias circuit.” Campardo contains no information regarding the voltages of sense nodes and reference nodes.

35 U.S.C. §103 Rejection

The Examiner rejected cancelled claims 21-45 under 35 U.S.C. §103 (a), as being unpatentable over Campardo.

The arguments presented above with regard to the rejection under 35 U.S.C. §102 (b) are also applicable here. As indicated above, there are significant differences between Campardo and the claims in the present application. In addition to the arguments already presented, it is submitted that Campardo does not teach or suggest all elements of the claims presented herein.

With regard to the element of claim 46 regarding pulling the voltage of the first drain bias circuit and the voltage of the second drain bias circuit to the potential of the voltage source, it is submitted that Campardo teaches *against* the element of the claim. Campardo, with its differing structure, warns against having an equalizing voltage that is too high (Campardo, col. 7, lines 56-63), and thus cannot be said to teach or suggest pulling drain bias circuit voltages to the potential of the voltage source.

With regard to the element of claim 46 regarding the shorting of the sense node and the reference node in response to the signal pulse, Campardo contains no teachings of any kind regarding this operation. The only statement regarding the voltages of the lines indicates that a black box circuit may provide for “possibly also equalizing lines 6 and 8

before the cell is actually read.” (Campardo, col. 2, lines 9-13) There is no indication how or under what circumstances such an action might be taken. As explained more fully above, the circuit that is actually shown and described does not have any function related to equalizing lines 6 and 8.

For at least the above reasons, claim 46 is patentable over Campardo.

Remaining Claims -- It is submitted that the arguments provided above are also applicable to independent claims 55, 61, and 67. The remaining claims are dependent claims and are allowable because they are being dependent on the allowable base claims.

CONCLUSION

Applicant respectfully submits that the prior rejections have been overcome by the amendment and remark, and that the claims as amended are now in condition for allowance. Accordingly, Applicant respectfully requests the rejections be withdrawn and the claims as amended be allowed.

Invitation for a Telephone Interview

The Examiner is requested to call the undersigned at (303) 740-1980 if there remains any issue with allowance of the case.

Request for an Extension of Time

Applicant respectfully petitions for an extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a) should one be necessary. Please charge our Deposit Account No. 02-2666 to cover the necessary fee under 37 C.F.R. § 1.17(a) for such an extension.

Charge our Deposit Account

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Date: 10/24/02



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AMENDMENTS -- MARKED VERSION

Presented below are the amendments with markings to indicate changes made.

In the Claims:

*Please delete **claims 21-45** without prejudice.*

Please amend the claims as follows:

46-67. [New]